SUPREME COURT OF THE UNITED STATES.

No. 285.—October Term, 1927.

Holland Furniture Company, Petitioner, *vs.* Perkins Glue Company.	On Writ of Certiorari to the United States Circuit Court of Appeals for the Sixth Circuit.

[May 14, 1928.]

Mr. Justice Stone delivered the opinion of the Court.

Respondent brought this suit in the district court for western Michigan, to enjoin infringement of the Perkins Reissued Patent No. 13436. So much of the judgment for the defendant, petitioner here, as held the product claims of the patent not infringed by respondent's product, was reversed by the court of appeals for the sixth circuit. *Perkins Glue Co.* v. *Holland Furniture Co.*, 18 Fed. (2d) 387. The court of appeals for the seventh circuit, *Perkins Glue Co.* v. *Gould Manufacturing Co.*, 292 Fed. 596, and the court of appeals for the second circuit, *Perkins Glue Co.* v. *Standard Furniture Co.*, 287 Fed. 109, had previously held the patent not infringed by the same product.[1] This Court granted certiorari. 275 U. S. —.

The patent is entitled "A Patent for Starch Glue and a Method of Making It." Perkins was the first to make successfully a starch glue suitable for wood veneering and similar uses. Glue made from animal substances, known as animal glue, has long been in common use as an adhesive and is especially adapted to use in wood veneering, in which thin sheets or layers of wood are fastened together by the use of an adhesive bonding material. The characteristic qualities of animal glue, making it peculiarly suitable for

[1]Other cases involving the patent in suit are Perkins Glue Co. v. Solva Waterproof Glue Co., 233 Fed. 792; Solva Waterproof Glue Co. v. Perkins Glue Co., 251 Fed. 64; Perkins Glue Co. v. Hood, 279 Fed. 454; Perkins Glue Co v. Holland Furniture Co., 279 Fed. 457; Perkins Glue Co. v. Standard Furniture Co., 279 Fed. 458; Perkins Glue Co. v. Gould Mfg. Co., 280 Fed. 728; Perkins Glue Co. v. Crandall Panel Co., 294 Fed. 135.

that use, are a low absorptiveness of water and a consequent high degree of fluidity, facilitating its application by mechanical means, high elasticity and great tensile strength. A high water content, characteristic of other adhesive preparations, delays drying, warps the wood and when dry leaves too little bonding material to secure the requisite strength. In practice animal glue is made suitably fluid for use in wood veneering by the addition of a critically small amount of water, three parts by weight to one of glue.

Long before Perkins' experiments, adhesive paste or mucilage made from starch was well known. The Gerard Patent (1874, Belgian, No. 34869 and the Dornemann Patent (1893, French, No. 232781) described a process of producing an adhesive or glue by dissolving starch in a solution of caustic alkali. The suitability of starch as a glue base in this and other processes depends upon its water absorptive quality which varies with the starch of different plants, and under varying conditions with the starch of the same plant. Because of their high water absorption, glues produced from starch, before Perkins, were too viscous and hence required too large an admixture of water for use successfully as a wood veneering glue. The controlling difficulty to be overcome in the development of a starch glue suitable for veneering was what may be called the normally large water absorptive quality of starch, corresponding to the viscosity of the resultant glue, a reduction of the one effecting a reduction in the other.

It has long been known that the viscosity or the water absorptive quality of starches may be reduced by chemical treatment known as degeneration in which changes in the arrangement of the atoms in the starch molecules are effected by use of a catalytic agent. In 1906 Gerson & Sachse (German, No. 167275) patented a process for the preparation of a starch base for glue manufacture by degenerating starch by the use of oxidizing agents in the presence of an alkali. But the resultant glue from this and other processes was not suitable for use in the wood-working trades. To make it sufficiently fluid for convenient use required too large an admixture of water, four parts or more to one of glue, so that the wood was warped and when dried the glue was not sufficiently tenacious to be used successfully as a substitute in that manufacture for animal glue.

The Perkins patent described a process for making glue from starch and a resultant product "as good as animal glue," "which

will have the great practical advantage that it may be practically used for the same purposes as the best animal glue." The process consisted of two steps. The basic material was a suitable raw starch, preferably starch made from the cassava root, and the first step was concerned with its conversion or degeneration so as to make a "glue base" with lower water absorptivity than ordinary untreated starch. This was to be accomplished by combining the basic raw material with oxidizing agents and subjecting them to heat. The method was that described in the Gerson & Sachse patent and was not new. The characteristic feature of this first step as described by Perkins was not the manner of degeneration but its degree. The degeneration of the raw cassava starch was to be carried to a point just short of its conversion into dextrine, a soluble starch, which, because of that property is of little value in glue manufacture. The patent in its re-issued form stated with precision the particular degree to which the water absorptive properties of the starch might be reduced in the preparation of a suitable glue base and described with particularity tests (the "9 to 1 boil up" test and the 170° test) for ascertaining when that stage of degeneration had been reached.

The second step in the process consisted in the treatment of the glue base, as prepared by the first step, by the addition of three parts or less of water by weight to one of the glue base and a specified percentage of cellulose solvent such as caustic potash. This process was described by the Gerard and Dornemann patents and was not new. The fundamental ideas of the process patent might be expressed in simple terms as follows: Glue made by dissolving ordinary starch in an alkaline solution of three parts of water (the quantity with which the wood-working industry is accustomed) is too thick. Glue made from over-degenerated starch is too weak. Between the extremes there is a range of degeneration within which the starch base, when dissolved in caustic potash, will produce glue of ample fluidity without loss of tensile strength or other qualities characteristic of animal glue.

The product claims, of which more will be said presently, was for the resultant glue, in substance for a starch glue having substantially the properties of animal glue.

The patent has thirty-eight claims, divisible into groups. One group covers the process of producing the degenerated starch glue base, the first step process, already described. One group em-

braces the glue base product produced by the first step process. Another group includes the process of dissolving the starch base, by the use of alkaline solvents, the second process step; another, the combination of the two process steps and finally the group with which we are now concerned is based upon the ultimate product, the glue itself. Three of the claims embraced in this ultimate product group are the only ones now in suit, 28, 30 and 31. They are as follows:

> 28. A glue comprising cassava carbohydrate rendered semi-fluid by digestion and having substantially the properties of animal glue.
>
> 30. A wood and fiber glue formed of a starchy carbohydrate or its equivalent by union therewith of about 3 parts or less by weight of water and alkali metal hydroxid.
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> 31. A wood and fiber glue containing amylaceous material as a base dissolved without acid in about three parts of water or less, and being viscous, semifluid and unjellified.

Of these the broadest in terms is No. 28, but it appears that a glue thus composed will not have "substantially the properties of animal glue" unless containing only the small amount of water specified in Claim 30. We may take it also that an article which is "wood and fiber glue" as described in the specifications will be "viscous, semifluid and unjellified" as described in Claim 31, and will also have substantially the properties of animal glue as specified in Claim 28, so that in point of substance the product claims in suit are for a starch glue which, combined with about three parts or less by weight of water will have substantially the same properties as animal glue.

With respect to the other or non-product groups of claims respondent, in consequence of earlier litigation, has filed a disclaimer. Brief reference must be made to both the litigation and the disclaimer. The respondent brought an infringement suit in the northern district of Illinois against the Solva Company, asserting an infringement of claims in each of the five groups by the product of that company, comprising in part at least a raw cassava starch glue base which, for present purposes, may be taken as identical with the product of the petitioner. Upon appeal to the seventh circuit court of appeals. *Solva Waterproof Glue Co.* v. *Perkins Glue Co.*, 251 Fed. 64, that court rendered an opinion, in some respects obscure, which has given rise to widely differing views as to its effect. In considering the present question we may assume that the court below was right in saying of that opinion,

"It held that the claims to the first step of the process, and to the product resultant therefrom—the glue base—were anticipated by Gerson & Sachse, and hence that the glue base, as a product and as the foundation of the second step in Perkins' process, was an old and unpatentable product. It found that Perkins' glue had the novelty and merit claimed for it. It sustained the claims to the compound two-step process, and to some extent at least, the claims to the ultimate product, and did not sustain the claims to the second-step process. No attention was paid to any distinctions in the different kinds of solva base that were involved. Its treatment of the process claims to the second-step process is open to the interpretation—and we think it the right one—that the Court considered those claims broad enough to cover the specified treatment as applied to any starch base however high in viscosity, and employing water to any extent, and even though the product would not approximate Perkins glue; and hence thought them invalid. If that view is correct they were too broad. At the conclusion of its opinion the court said that the decree 'below sustaining the claims for the glue base and [first step] product, and for the so-called second step as such, is reversed, and that part of it which upholds the claims of the patent for the final process and the resultant product is affirmed.' "

We may assume also the correctness of the view of the court below that the effect of this decision was to sustain broadly the claim to the resultant product, the glue described in claims 28, 30 and 31, as distinguished from the intermediate product which was the resultant of the first step and was found to be old, and that the product claims thus upheld included a starch glue having substantially the properties of animal glue whether made by the employment of both steps of the compound process or not.

As a result of this decree the plaintiff filed a disclaimer of all the claims for the glue base itself and all those for the first process step. It also disclaimed from the second process step "any process of making glue, excepting where the starch or starchy product or carbohydrate subjected to the process, is degenerated to the extent described [in the patent], whereby the process results in the good as animal glue described" in the patent. Again we assume that the court below was right in saying that the effect of the disclaimer as to the second step claims was to limit them to a process where the material with which the second process step begins is any starch in fact degenerated to the point necessary to produce the result at which the second process step is aimed,

whether the degeneration is effected by the first step or other artificial process or the suitable starch is a natural agricultural product, sufficiently degenerated without chemical treatment and purchaseable in commercial quantities.

The second step process as narrowed by the disclaimer consists in the selection of a starch suitably degenerated, no matter how, and the treatment of it with an alkali as in the Gerard and Dornemann patents, but by the terms of the disclaimer only such starches are suitable, that is to say, fall within the range of selection, which, when treated by the second step process, will produce a glue as good as animal glue for veneering. The use or function of the resultant glue is made the measure or test of the choice of its ingredients.

Apparently no brand of raw starch which Perkins could procure in commercial quantities when conducting his experiments could be used as a glue base without the artificial degeneration of his first step. But it appears that the defendant has been able to purchase in such quantities a starch which is a natural agricultural product having a low water absorptiveness and other characteristics making it suitable for use as a glue base. Beginning with this starch the petitioner employs what is in effect so much of Perkins' second step as is old by combining the starch with three parts of water or less and approximately 4% of caustic soda. The mixture, when agitated and heated, produces a glue which petitioner says is heavier than animal glue, but which is used commercially as a substitute for it and which, for present purposes, may be taken as having substantially the qualities of animal glue. Whether the result may be attributed wholly to reduced viscosity of the starch, due to changed methods of cultivation or manufacture, or in some measure to peculiarities of petitioner's dissolving operation does not appear.

Petitioner contends that the raw starch selected and used by it in the manufacture of its product has high water absorptive qualities above the range defined by the patent, not satisfying the tests laid down in the patent for ascertaining whether the appropriate stage for degeneration has been reached for the employment of the second step. As the process claims are not before us this contention has bearing only upon the broad product claims which are the subject of the present suit. It is the contention of the respondent, and the court below held, that its product claims 28,

30 and 31, concededly broad enough, as stated, to cover the petitioner's product, are valid and that all starch veneering glues, at least when mixed with three parts of water or less, having substantially the properties of animal glue, infringe the patent whether made by Perkins' process or otherwise.

We take it, as the respondent argues, that product patents or patents of compositions of matter are distinct from patents of the process by which the product may be produced. The former, if sufficiently described, may exist and be sustained independently of the latter. *Rubber Company* v. *Goodyear*, 9 Wall. 788; *Leeds & Catlin* v. *Victor Talking Machine Co.*, 213 U. S. 301, 318. Hence any narrowing of process claims is not necessarily a narrowing of product claims. So much of the claim as is saved from the second step of Perkins' process after the disclaimer and referred to here as a process claim is, in fact, only the choice of an ingredient of the glue product, independently of the chemical process of producing it. It was necessary that the Perkins' patent, so far as it is a patent of a composition of matter, should contain some description of the ingredients entering into the composition which would both define the patent, *Grant* v. *Raymond*, 6 Pet. 218, 247; *Wood* v. *Underhill*, 5 How. 1, 5; *Tyler* v. *Boston*, 7 Wall. 327, 330; *Béné* v. *Jeantet*, 129 U. S. 683; *Howard* v. *Detroit Stove Works*, 150 U. S. 164, 167, and carry it beyond the previous development of the art. Had Perkins claimed only a glue made of starch dissolved in three parts of water with an alkali, he would not have advanced beyond the Gerard and Dornemann patents and subsequent practice. As his patent discloses, it was well known that ordinary starch treated in this manner produced a thick glue unsuitable for wood veneering if made with three parts of water, and a thin glue not strong enough for wood veneering if made with four parts or more of water.

Perkins' real invention, apart from the combination of his first and second step processes, with which we are not now concerned, was that by the use of a particular kind of starch as an ingredient a new composition of matter was made for which he claimed his patent. Some description of this product was obviously essential to patentability and Perkins in the reissued patent sought to meet this necessity in two ways. One was to describe the product by describing its characteristic ingredient with particularity. If we look at the specifications, as we may, he did this by indicating the range of

water absorptivity, or stated in another way the degeneration, of the starch ingredient in Perkins' glue. As described the starch ingredient fell short of dextrine or soluble starch, but was of lower water absorptivity than petitioner's glue base. The glue made of this ingredient within the specified range was a new product. This was invention of a new composition of matter and was the real contribution Perkins made to the art. As such it was entitled to the protection of a patent but as thus described and limited petitioner's product does not infringe.

To so describe the product is not, as the court below seemed to think, a limitation of product claims by reference to process claims. A patentable process is a method of treatment of certain materials to produce a particular result or product. *Cochrane* v. *Deener*, 94 U. S. 780. The description of one does not necessarily embrace the other. Either or both may be patentable. But here we are concerned only with the choice of one ingredient of the product. There can be no description of a composition of matter without some designation of its ingredients. If the selection or choice or designation of an essential ingredient of a composition of matter may be referred to, inaccurately as we think, as a process, the "process" is one inseparable from the composition itself. The description of one necessarily limits the other. Hence the patent of the product cannot extend beyond a product having the designated ingredient. See *Powder Co.* v. *Powder Works*, 98 U. S. 126, 137; *Béné* v. *Jeantet*, *supra*; *Goodyear Dental Vulcanite Co.* v. *Davis*, 102 U. S. 222.

Perkins' second way of describing the starch ingredient of his product was in terms of the use or function of the product itself. The chosen starch ingredient was to possess such qualities that when combined with three parts of water and with alkali it would produce a product "as good as animal glue" for veneering, or having the properties of animal glue, these properties being described in terms of its functions. The ingredient was thus described, not in terms of its own physical characteristics or chemical properties or those of the product, but wholly in terms of the manner of use of the product. Any glue made of a starch base, whatever its composition, water absorptiveness or other properties, combined with alkali and three parts of water, which has substantially the properties of animal glue, or is as good as animal glue for use in the wood-working trades, is claimed as Perkins'

glue. Thus the inventor who advances the art by discovery that a certain defined material may be combined in a product useful for certain purposes seeks to extend his monopoly to any product which may subsequently be made from materials not within any defined range described in the patent, but which is likewise useful for those purposes.

But an inventor may not describe a particular starch glue which will perform the function of animal glue and then claim all starch glues which have those functions, or even all starch glues made with three parts of water and alkali, since starch glues may be made with three parts of water and alkali that do not have those properties. See *The Incandescent Lamp Patent*, 159 U. S. 465, 472. Revised Stat., § 4888, requires that the patent shall contain a description of the invention "and of the manner and process of making, constructing, compounding, and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same." One attempting to use or avoid the use of Perkins' discovery as so claimed and described functionally could do so only after elaborate experimentation. Respondents say that laboratory tests would be insufficient and that "the best and probably the only satisfactory test is to try it out on a large scale in a furniture or veneering gluing factory." A claim so broad, if allowed, would operate to enable the inventor who has discovered that a defined type of starch answers the required purpose to exclude others from all other types of starch and so foreclose efforts to discover other and better types. The patent monopoly would thus be extended beyond the discovery and would discourage rather than promote invention. *The Incandescent Lamp Patent, supra*, 476. That the patentee may not by claiming a patent on the result or function of a machine extend his patent to devices or mechanisms not described in the patent is well understood. *O'Reilly* v. *Morse*, 15 How. 62, 112, 113; *Knapp* v. *Morss*, 150 U. S. 221, 228; *Electric Signal Co.* v. *Hall Signal Co.*, 114 U. S. 87; *Westinghouse* v. *Boyden Power Brake Co.*, 170 U. S. 537; *Mitchell* v. *Tilghman*, 19 Wall. 287; *Fuller* v. *Yentzer*, 94 U. S. 288; *Ridson Iron & Locomotive Works* v. *Medart*, 158 U. S. 68. Respondent argues that this principle, applicable to machine patents, is inapplicable to a patent for the composition of matter which is always a result of a process and

concededly is patentable as such, but the attempt to broaden product claims by describing the product exclusively in terms of its use or function is subject to the same vice as is the attempt to describe a patentable device or machine in terms of its function. As a description of the invention it is insufficient and if allowed would extend the monopoly beyond the invention. See *Béné* v. *Jeantet, supra; Cochrane* v. *Badische Anilin & Soda Fabrik,* 111 U. S. 293; *The Incandescent Lamp Patent, supra; Matheson* v. *Campbell,* 78 Fed. 910; *American Adamite Co.* v. *Mesta Machine Co.,* 18 Fed. (2d) 538.

So far as respondent seeks to enlarge its product patent by subordinating the patent description of the starch ingredient which the patentee used, and which respondent does not use, to the vague and indefinite description in the three product claims now in suit, the patent is subject to the same vice.

Reversed.

A true copy.

Test:

Clerk, Supreme Court, U. S.